ABSTRACT OF THE DISCLOSURE

Laser lines at 635 nm or longer (ideally 647 nm) are preferred for red, giving energy-efficient, bright, rapid-motion images with rich, full film-comparable colors. Green and blue lines are used too — and cyan retained for best color mixing, an extra light-power boost, and aid in speckle suppression. Speckle is suppressed through beam-path displacement — by deflecting the beam during projection, thereby avoiding both absorption and diffusion of the beam while preserving pseudo-collimation (noncrossing rays). The latter in turn is important to infinite sharpness. Path displacement is achieved by scanning the beam on the liquid-crystal valves (LCLVs), which also provides several enhancements — in energy efficiency, brightness, contrast, beam uniformity (by suppressing both laser-mode ripple and artifacts), and convenient beam-turning to transfer the beam between apparatus tiers. Preferably deflection is performed by a mirror mounted on a galvanometer or motor for rotary oscillation; images are written incrementally on successive portions of the LCLV control stage (either optical or electronic) while the laser "reading beam" is synchronized on the output stage. The beam is shaped, with very little energy loss to masking, into a shallow cross-section which is shifted on the viewing screen as well as the LCLVs. Beam-splitter/analyzer cubes are preferred over polarizing sheets. Spatial modulation provided by an LCLV and maintained by pseudocollimation enables imaging on irregular projection media with portions at distinctly differing distances from the projector — including domes, sculptures, monuments, buildings; waterfalls, sprays, fog, clouds, ice; scrims and other stage structures; trees and other foliage; land and rock surfaces; and even assemblages of living creatures including people.